DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 5/16/08 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-6, 8, 12-14 and 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ota et al. (US 5,486,338) in view of Cheung (US 4,193,793) and Maus et al. (US 5,916,530).

Regarding claim 1, Ota discloses a honeycomb body comprising:

a housing (2);

a matrix (corrugated foils (8) and flat sheets (7), inside housing) having a diameter and connected to said housing (see Figs. 1, 2, 3, 5, 6); and

at least one contraction limiter (5, 9a, 9b, 10, 11) causing an outwardly directed tensile stress in at least one part of said matrix (see Figs. 1, 2, 3, 5, 6).

Ota teaches a contraction limiter/cushion, housing and matrix/honeycomb made of stainless steel (col. 3 lines 23-24), but does not teach said contraction limiter having a specific heat capacity between a specific heat capacity of said housing and matrix. In other words, Ota teaches a structure where the matrix, the contraction limiter and the housing all contain the same specific heat capacity.

Cheung also discloses a honeycomb body that is utilized for purification of exhaust gases (see abstract).

Cheung teaches utilizing a low specific heat capacity catalyst carrier (col. 13 lines 58-62) in order to reduce the startup time needed for the purification catalyst to become active (col. 13 lines 16-20).

As such, decreasing the specific heat capacity of the catalyst substrate of Ota in relation to the other support structures of a catalytic converter to a specific heat capacity lower than the specific heat capacity of the stainless steel contraction limiter, as taught by Cheung, would have been obvious to one of ordinary skill in the art at the time of the invention in order to reduce the heat-up time of the catalyst substrate in order for the purification reaction to become active. In other words, forming the matrix of Ota out of a material which has a lower specific heat capacity than stainless steel (which the contraction limiter is) would have been obvious to one of ordinary skill in the art at the time of the invention in order to expedite the startup time of the catalyst contained on the matrix.

Furthermore, Ota, as modified by Cheung, teaches a stainless steel contraction limiter and a matrix made of a material which has a lower specific heat capacity than stainless steel (as discussed above), but does not explicitly disclose the housing having specific heat capacity greater than the contraction limiter.

Maus also discloses a honeycomb body comprising a casing/housing (1), a contraction limiter (11b, see Fig. 3) and a matrix (2).

Maus teaches that the housing/casing is constructed of a material that has a high heat capacity relative to the contraction limiter or the matrix in order to provide a storage point for heat so after the catalytic converter is shutdown, the cool-down process is slowed due to the dissipation of heat from the casing (1), through the contraction limiter (11) and to the matrix (2) (see abstract, col. 3 lines 17-35, 49-60).

As such, it would have been obvious to one of ordinary skill in the art at the time of the invention to construct the casing of modified Ota, out of a material that has a higher specific heat capacity than the stainless steel contraction limiter of Ota, as taught by Maus in order to provide a storage point for heat so after the catalytic converter is shutdown, the cool-down process is slowed due to the dissipation of heat from the casing, through the contraction limiter and to the matrix

Regarding limitations recited in claim 1 which are directed to a manner of operating disclosed system, neither the manner of operating a disclosed device nor material or article worked upon further limit an apparatus claim. Said limitations do not differentiate apparatus claims from prior art. See MPEP §2114 and 2115. Further, process limitations do not have a patentable weight in an apparatus claim. See *Ex parte Thibault*, 164 USPQ

666, 667 (Bd. App. 1969) that states "Expressions relating the apparatus to contents thereof and to an intended operation are of no significance in determining patentability of the apparatus claim.

Regarding claim 2, Ota, as discussed in claim 1 above, further discloses said matrix (8,7) is connected to said housing (3) by said contraction limiter (cushion member (5) and joints (9a)).

Regarding claim 3, Ota, as discussed in claim 1 above, further discloses said contraction limiter (11) has a first end region (11b) connected to said matrix (see Fig. 11) resulting in a connecting region, and a second end region (11a) connected to said housing (2, see Fig. 11) resulting in a fastening region).

Regarding claim 4, Ota, as discussed in claim 1 above, further discloses said contraction limiter (11) and said matrix (3) have a common connecting region (11b, see Fig. 11); and

said matrix (3) has walls (7) connected to one another by joining connections (corrugated foil (8)), the tensile stress being applied through said common connecting region.

Regarding claim 5, where the claimed and prior art product(s) are identical or substantially identical, or are produced by identical or substantially identical process(es) the burden of proof is on applicant to establish that the prior art product(s) do not necessarily or inherently possess the characteristics of the instantly claimed product(s), see *In re Best,* 195 USPQ 430.

Regarding claims 6 and 21-23 Ota, as discussed in claim 1 above, further discloses said contraction limiter (cushion sections 11) and said matrix (3) have a common connecting region (11b), said common connecting region is disposed close to an end side of said matrix (Ota discloses said cushion sections and joining sections are provided over the entire axial length i.e. up to the edge of said matrix, as pictured in Figs. 7 and 8, see col. 5 lines 40-44).

Regarding claim 8, Ota, as discussed in claim 1 above, further discloses:

said matrix (3) has a circumference (see Fig. 2); and

said contraction limiter (5, 6 in Fig. 1) is one of a plurality of contraction limiters (see Fig. 10) disposed axially one behind another (see Fig. 1), with an offset with respect to one another in a direction of said circumference of said matrix (see Fig. 11).

Regarding claim 12, Ota, as discussed in claim 1 above, further discloses said matrix (3) has walls formed of at least partially structured sheet-metal foils (metal honeycomb, see abstract) stacked and/or coiled forming channels through which a gas can flow (honeycomb, see Fig. 3).

Regarding claim 13, Ota, as discussed in claim 12 above, further discloses said matrix (3) is at least partially surrounded by an outer structured foil (foil (7) see Fig. 2).

Regarding claim 14, Ota, as discussed in claim 12 above, further discloses said sheet-metal foils have a thickness of less than 0.06 mm (.05mm, col. 5 line 50-52).

4. Claims 1-20 and 24-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cyron et al. (US 4,795,615) in view of Cheung (US 4,193,793).

Regarding claims 1 and 27, Cyron discloses a honeycomb body for exhaust gas purification, comprising:

a housing (2);

a matrix (1) having a diameter; and

at least one contraction limiter (4a, 4b, 4c) causing an outwardly directed tensile stress in at least one part of said matrix (see Fig. 1).

Cyron teaches a contraction limiter/joint, housing/jacket and matrix/carrier body made of metallic material (col. 2 lines 23-24), but does not teach said contraction limiter having a specific heat capacity between a specific heat capacity of said housing and matrix. In other words, Cyron teaches a structure where the matrix, the contraction limiter and the housing all contain the same specific heat capacity.

Cheung also discloses a honeycomb body that is utilized for purification of exhaust gases (see abstract).

Cheung teaches utilizing a low specific heat capacity catalyst carrier (col. 13 lines 58-62) in order to reduce the startup time needed for the purification catalyst to become active (col. 13 lines 16-20).

As such, decreasing the specific heat capacity of the catalyst substrate of Cyron in relation to the other support structures of a catalytic converter to a specific heat capacity lower than the specific heat capacity of the metallic contraction limiter, as taught by Cheung, would have been obvious to one of ordinary skill in the art at the time of the invention in order to reduce the heat-up time of the catalyst substrate in order for the purification reaction to become active. In other words, forming the matrix of Cyron out

of a material which has a lower specific heat capacity than the metallic material (which the contraction limiter is) would have been obvious to one of ordinary skill in the art at the time of the invention in order to expedite the startup time of the catalyst contained on the matrix.

Furthermore, Cyron, as modified by Cheung, teaches a metallic contraction limiter and a matrix made of a material which has a lower specific heat capacity than the metallic material of the contraction limiter (as discussed above), but does not explicitly disclose the housing having specific heat capacity greater than the contraction limiter.

Maus also discloses a honeycomb body comprising a casing/housing (1), a contraction limiter (11b, see Fig. 3) and a matrix (2).

Maus teaches that the housing/casing is constructed of a material that has a high heat capacity relative to the contraction limiter or the matrix in order to provide a storage point for heat so after the catalytic converter is shutdown, the cool-down process is slowed due to the dissipation of heat from the casing (1), through the contraction limiter (11), or inherently by radiation, and to the matrix (2) (see abstract, col. 3 lines 17-35, 49-60).

As such, it would have been obvious to one of ordinary skill in the art at the time of the invention to construct the casing of modified Cyron, out of a material that has a higher specific heat capacity than the metallic contraction limiter of Cyron, as taught by Maus in order to provide a storage point for heat so after the catalytic converter is shutdown, the cool-down process is slowed due to the dissipation of heat from the casing, through the contraction limiter and to the matrix

Regarding limitations recited in claim 1 which are directed to a manner of operating disclosed system, neither the manner of operating a disclosed device nor material or article worked upon further limit an apparatus claim. Said limitations do not differentiate apparatus claims from prior art. See MPEP §2114 and 2115. Further, process limitations do not have a patentable weight in an apparatus claim. See *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969) that states "Expressions relating the apparatus to contents thereof and to an intended operation are of no significance in determining patentability of the apparatus claim.

Regarding claim 2, Cyron, as discussed in claim 1 above, further discloses said matrix (1) is connected to said housing (2) by said contraction limiter (see Fig. 1).

Regarding claim 3, Cyron, as discussed in claim 1 above, further discloses said contraction limiter (4a, 4b, 4c) has a first end region (5a, 5b, 5c) connected to said matrix resulting in a formation of a connecting region, and a second end region (6, 7) connected to said housing resulting in a formation of a fastening region.

Regarding claim 4, Cyron, as discussed in claim 1 above, further discloses said contraction limiter (4a, 4b, 4c) and said matrix (1) have a common connecting region (5a, 5b, 5c); and

said matrix has walls (flat sheets) connected to one another by joining connections (corrugated sheets, col. 7 lines 1-10). Furthermore, where the claimed and prior art product(s) are identical or substantially identical, or are produced by identical or substantially identical process(es) the burden of proof is on applicant to establish that the

prior art product(s) do not necessarily or inherently possess the characteristics of the instantly claimed product(s), see In re Best, 195 USPQ 430.

Regarding claim 5, where the claimed and prior art product(s) are identical or substantially identical, or are produced by identical or substantially identical process(es) the burden of proof is on applicant to establish that the prior art product(s) do not necessarily or inherently possess the characteristics of the instantly claimed product(s), see *In re Best*, 195 USPQ 430.

Regarding claim 6, Cyron, as discussed in claim 1 above, further discloses said contraction limiter (4c) and said matrix (1) have a common connecting region (5c), said common connecting region is disposed close to an end side of said matrix (see Fig. 1).

Regarding claim 7, Cyron, as discussed in claim 1 above, further discloses said matrix (1) and said housing (2) define an annular gap (8) between them and surrounding said matrix (see Fig. 1), and said contraction limiter seals said annular gap surrounding said matrix (sealing lips, see col. 3 lines 57-68).

Regarding claim 8, Cyron, as discussed in claim 1 above, further discloses:

said matrix (1) has a circumference (see Fig. 2); and

said contraction limiter is one of a plurality of contraction limiters (see 4a, 4b, and 4c) disposed axially one behind another (see Fig. 1), with an offset with respect to one another in a direction of said circumference of said matrix (being offset axially, inherently makes them offset circumferentially, as in, they are not sequential circumferentially).

Regarding claim 9, Cyron, as discussed in claim 1 above, further discloses said contraction limiter (4a, 4b, 4c are formed from metallic woven screens, col. 6 lines 7-10) and said matrix (carrier body 1, formed from ceramic, col. 4 lines 16-20) are formed from different materials.

Regarding claim 10, Cyron, as discussed in claim 1 above, further discloses said matrix is thermally insulated with respect to said housing (via insulating material, see claim 11 of Cyron).

Regarding claim 11, Cyron, as discussed in claim 1 above, further discloses said contraction limiter has a coefficient of thermal expansion which is different from said matrix (as mentioned above, the contraction limiter is composed of a metal screen and the matrix is formed from ceramic, which have a different thermal expansion).

Regarding claim 12, Cyron, as discussed in claim 1 above, further discloses said matrix (1) has walls formed of at least partially structured sheet-metal foils (metallic sheets, col. 6 line 59 – col. 7 line 10) stacked and/or coiled forming channels through which a gas can flow (honeycomb, see Fig. 3).

Regarding claim 13, Cyron, as discussed in claim 12 above, further discloses said matrix (1) is at least partially surrounded by an outer structured foil (brazing foil, col. 7 lines 19-21).

Regarding claim 16, Cyron, as discussed in claim 1 above, further discloses said matrix contains a catalytically active material (catalyst carrier, see abstract)

Regarding claim 17, Cyron, as discussed in claim 1 above, further discloses said contraction limiter (4a, 4b, 4c) has means for preventing crack propagation (no firm connection prevents damage/cracks due to the elastic means, see col. 2 lines 35-39).

Regarding claim 20, Cyron, as discussed in claim 12 above, further discloses said matrix (1) is at least partially surrounded by an outer structured foil (brazing foil, col. 7 lines 19-21) that at least partially forms said contraction limiter (brazing foil is used attach contraction limiter to housing and matrix, col. 7 lines 28-42).

Regarding claim 24, Cyron, as discussed in claim 8 above, further discloses said plurality of contraction limiters are flexible in a direction of an axis of said matrix for allowing a free axial contraction and expansion of said matrix (col. 3 lines 33-39).

Regarding claim 25, Cyron, as discussed in claim 1 above, further discloses the honeycomb body is used in an exhaust system of an internal combustion engine (col. 7 lines 49-52).

Regarding claim 26, Cyron, as discussed in claim 1 above, further discloses said matrix is a metallic matrix (see abstract).

Regarding claims 14, 15, 18 and 19, while Cyron, as set forth in claim 12 above doesn't teach the thickness of the sheet metal of the honeycomb or the density of the cells in the honeycomb it was well known in the art at the time of the invention that these variables have a direct relationship to the performance of the honeycomb (for example, more cells, thinner walls yields more surface area for catalyst, as implied by Cyron, col. 6 lines 42-58). As such, these dimensions are not considered to confer patentability to the claim. These variables would have been considered a result effective variable by one

having ordinary skill in the art at the time the invention was made. As such, without showing unexpected results, the claimed size of the sheet metal and density of the cells cannot be considered critical. Accordingly, one of ordinary skill in the art at the time the invention was made would have optimized, by routine experimentation, the size and density of the cells to obtain the desired performance (In re Boesch, 617 F. 2d. 272,205 USPQ 215 (CCPA 1980)). Since it has been held that where general conditions of the claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (In re Aller, 105 USPQ 223).

Response to Arguments

5. Applicant's arguments filed 4/28/08 have been fully considered but they are not persuasive.

6. On page 11 and 12 (and repeated on pages 14 and 15 for the Cyron reference), as best understood, Applicant argues that Ota and Cheung do not teach the claimed relationship between the specific heat capacities of the matrix, contraction limiter and housing. While the specific heat capacity of the housing is a new limitation that was not present in the previous version of the claims, the examiner would like to comment on the relationship between the specific heat capacities of the matrix and the contraction limiter. In the claims, the specific heat capacities are only referred to in relation to other portions of the catalytic converter and are not given any concrete values (either by heat capacity value, or the implication of a specific heat capacity by claiming the material used to construct these components). As such, the examiner finds the teaching of Cheung to lower the specific heat capacity of the matrix to the lowest possible level

in order to reduce startup time as sufficient motivation for one of ordinary skill in the art to reduce the heat capacity of the stainless steel matrix of Ota (and the metallic material of Cyron, in the other rejection of claim 1) to a level below the stainless steel (or metallic material) contraction limiter. The examiner includes the reasoning for the claimed relationship to the housing specific heat capacity above in the new rejection.

7. On pages 16 and 17, Applicant argues that the limitations contained in claim 1 (regarding the percentage of change in diameter of the matrix when it is exposed to thermal stresses) are material properties as opposed to limitations directed toward a method of using the claimed apparatus. Applicant further states on page 18 that "While it is true that the degree of thermal expansion/contraction is dependent on the temperature variation of the apparatus, the material properties which provide for degree of thermal expansion/contraction are always present in the structural element." Applicant appears to contradict his argument in this sentence. The "degree" of expansion/contraction is indeed dependent on the temperature variation. As such, this degree will be different depending on the operating temperature variation, regardless of the material properties.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MATTHEW J. MERKLING whose telephone number is (571)272-9813. The examiner can normally be reached on M-F 8:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on (571) 272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. J. M./
Examiner, Art Unit 1795

/Alexa D. Neckel/
Supervisory Patent Examiner, Art Unit 1795